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C L A I M S

1. Process to cool hot gas by passing the hot gas through a tube having a main tubular part and an upstream tubular part, wherein (i) the exterior of main tubular part is cooled by an evaporating liquid cooling medium flowing freely inside a vessel and around said tube, (ii) the upstream tubular part is cooled by passing fresh liquid cooling medium and a defined part of the liquid cooling medium of activity (i) along the exterior of the upstream tubular part and (iii) wherein the mixture of fresh cooling medium and the defined part of the liquid medium after being used to cool the upstream tubular part is used in activity (i) as cooling medium.
2. Process according to claim 1, wherein the volume ratio of fresh cooling medium and the defined part of the cooling medium as extracted from activity (i) is between 1:4 and 4:1.
3. Process according to any one of claims 1-2, wherein the upstream tubular part is cooled by passing fresh liquid cooling medium and a defined part of the liquid cooling medium of activity (i) along the exterior of the upstream end of the tube co-current with the gas flowing within the tube.
4. Process according to any one of claims 1-3, wherein the hot gas has a temperature of between 1300 and 1500 °C and a temperature of between 240 and 450 °C after being subjected to the process.
5. Process according to any one of claims 1-4, wherein the hot gas is obtained in a gasification process, comprising the partial oxidation of a gaseous or liquid hydrocarbon feedstock to a mixture comprising mainly hydrogen and carbon monoxide.

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6. Apparatus for cooling hot gas comprising:

- 5 (i) a vessel provided with a cooling medium compartment, an inlet to supply fresh cooling medium and a outlet for discharge of used cooling medium, said vessel further provided with an inlet for hot gas and an outlet for cooled gas, at least one heat exchange tube fluidly connecting the inlet for hot gas and the outlet for cooled gas positioned in the cooling medium compartment, wherein said tube is mounted at least at or near its upstream end in a tube plate, wherein
- 10 (ii) a means for extracting a volume of the cooling medium from the cooling medium compartment is present and wherein
- 15 (iii) the upstream end of the tube is provided with a cooling means comprising means to supply a mixture of the extracted cooling medium and part or all of the fresh cooling medium as supplied to said vessel along the exterior of the upstream end of tube.

7. Apparatus according to claim 6, wherein an annular sleeve is positioned around the upstream end of the heat exchange tube and wherein this upstream end is mounted in a tubesheet, the annular sleeve having an opening to allow the mixture of extracted cooling medium and part or all of the fresh cooling medium to enter and an outlet opening fluidly connected to the cooling medium compartment.

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8. Apparatus according to any one of claims 6-7, wherein means to supply part of the fresh cooling medium to an elevated position in the vessel is present.

9. Configuration of a partial oxidation reactor and an apparatus according to any one of claims 6-8 fluidly connected at their lower end by a horizontal duct, wherein in said duct the upstream end of the heat exchanger tube and its cooling means are positioned.

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10. Use of the apparatus according to claims 6-8 in a process according to claims 1-5.